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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/759,448

01/16/2004

Chenghong Li

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HOVEY WILLIAMS LLP
2405 GRAND BLVD., SUITE 400
KANSAS CITY, MO 64108

EXAMINER

JACKSON, MONIQUE R

ART UNIT

PAPER NUMBER

1773

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

03/09/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

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Office Action Summary	Application No. 10/759,448	Applicant(s) LI ET AL.	
	Examiner Monique R. Jackson	Art Unit 1773	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26, 28, 30-36, 69-74, 78 and 79 is/are pending in the application.
 4a) Of the above claim(s) 1-22 and 69-74 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 23-26, 28, 30-36, 78 and 79 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The amendment filed 6/26/06 has been entered. Claims 27, 29, 37-68 and 75-77 have been canceled. New claims 78-79 have been added. Claims 1-26, 28, 30-36, 69-74, 78 and 79 are pending in the application. Claims 1-22 and 69-74 have been withdrawn from consideration.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 102

3. Claims 23, 28, 35 and 78 are rejected under 35 U.S.C. 102(b) as being anticipated by Plueddenmman (USPN 3,398,044.) Plueddenmman teaches a process of bonding (a) an organic polymer such as thermoplastic resins to (b) an inorganic solid substrate such as siliceous materials, inorganic oxides and metals, by applying to a surface of at least one of (a) and (b) a material (c) comprising a silicone substance selected from the group consisting of compounds of the formula disclosed at Col. 1, line 54-Col. 2, line 12, wherein R can be a phenyl group and R' can be alkoxy groups or halogen atoms; and bringing (a) and (b) into contact with each other with (c) between them (Abstract; Col. 1, line 25-Col. 2, line 15; Col. 2, line 63-Col. 3, line 35.) Plueddenmman teaches that any solid polymer may be utilized for (a) and specifically recite polystyrene, poly(styrene-acrylonitrile) as utilized in Example 1, poly(acrylonitrile-butadiene-styrene) (Col. 2, lines 18-25.) In terms of the inorganic substrate, Plueddenmman teaches that the solid substrate (b) may be glass sheets, glass cloth, other glass substrates, ceramic sheets, and other inorganic materials such as metals and metal oxides (Col. 2, lines 35-40.) Plueddenmman teaches that the ingredient (c) can be a mixture of silanes or cohydrolyzate as well as a single silane or hydrolyzate wherein not all of the silanes need possess an A group and examples of

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other silanes that can be present include dimethdimethoxysilane, phenyltrichlorosilane (reads upon the claimed structure), and 3,3,3-trifluoropropyldimethylsilanol (Col. 3, lines 36-42.) Plueddenmman teaches that the amount of (c) utilized is not critical but that the bond will increase as more of (c) is added until a maximum strength is reached wherein this maximum is achieved when (c) covers the substrate in roughly a monomolecular layer (reads upon the claimed thickness.) Plueddenmman also teaches that the substrate with ingredient (c) thereon can be heated in order to dry it before the other substrate is applied and that optionally the silane primer can be applied to both substrates before bringing them together and heating to form a stable bond (Col. 4, lines 15-23.) Hence, one having ordinary skill in the art at the time of the invention would have clearly envisaged a laminate comprising poly(styrene-acrylonitrile), a silane compound that reads upon the claimed structure, and an inorganic substrate including the claimed “microelectronic substrate” materials such as glass, quartz, or metal sheet. With respect to the claim limitations “microelectronic structure” and “a microelectronic substrate having a surface”, the Examiner takes the position that the term “microelectronic” refers to the intended use of the substrate/structure, and as claimed, does not provide any additional structural or material limitations to the substrate or the laminate. Therefore, considering the substrate taught by Plueddenmman has a surface and both the substrate and the structure may be utilized in producing microelectronic devices, the invention taught by Plueddenmman anticipates the instant claims.

4. Claims 23, 35, and 78 are rejected under 35 U.S.C. 102(b) as being anticipated by Plueddenmman (USPN 3,461,027, hereafter referred to as Plueddenmman ‘027.)

Plueddenmman ‘027 teaches a method of bonding silane-primed siliceous or metallic materials

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to an organic thermoplastic polymer, such as polystyrene, by coating the siliceous solid material such as glass fibers or metal panels with a silane of the formula described at Col. 1, lines 14-28, to improve the bonding between the solid material and the organic thermoplastic polymer (Abstract; Col. 1, lines 14-31.) Plueddenmman '027 teaches that the solid siliceous material can be sheets of glass, quartz or rock, glass cloth or fibers, metals such as aluminum sheeting and metal oxides (Col. 3, lines 16-23.) The organic thermoplastic polymer can be polystyrene, poly(styrene-acrylonitrile), poly(acrylonitrile-butadiene-styrene, other vinyl polymers, polyesters, polyamides or polycarbonates (Col. 2, line 57-Col. 3, line 4.) The silane has the formula described in detail at Col. 1, line 57-Col. 2, line 57, wherein Ar is any divalent aryl radical such as phenylene or biphenylene, X can be an alkoxide group or halogen, and R can be any lower alkyl (reads upon the claimed structure), and Plueddenmman '027 discloses structures that read upon the claimed silane structure including a specific silane that also reads upon the claimed silane structure (namely 4-methoxyphenyltrimethylsilane; Col. 1, line 57-Col. 2, line 57; Col. 3-4; Examples.) Plueddenmman '027 teaches that the silane primer is preferably applied in a diluted form by dipping, brushing, spraying, etc., to the siliceous sheet, dried, and then a film of the thermoplastic polymer may be applied (Col. 3, lines 25-43; Examples.) Plueddenmman '027 further teach that the preferred thermoplastic polymer is one which contains aromatic units, for example polymers and copolymers containing styrene (Col. 3, lines 47-48) wherein Plueddenmman '027 previously disclosed polystyrene, poly(styrene-acrylonitrile), poly(acrylonitrile-butadiene-styrene (Col. 2, line 57-61.) Hence, one having ordinary skill in the art at the time of the invention would have clearly envisaged a laminate comprising poly(styrene-acrylonitrile), a silane compound that reads upon the claimed structure, and an inorganic

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substrate including the claimed “microelectronic substrate” materials such as glass, quartz, or metal sheet. With respect to the claim limitations “microelectronic structure” and “a microelectronic substrate having a surface”, the Examiner takes the position that the term “microelectronic” refers to the intended use of the substrate/structure, and as claimed, does not provide any additional structural or material limitations to the substrate or the laminate. Therefore, considering the substrate taught by Plueddenmman ‘027 has a surface and both the substrate and the structure may be utilized in producing microelectronic devices, the invention taught by Plueddenmman ‘027 anticipates the instant claims.

Claim Rejections - 35 USC § 103

5. Claims 24-26, 30-34, 36 and 79 are rejected under 35 U.S.C. 103(a) as being unpatentable over Plueddenmman. The teachings of Plueddenmman are discussed above. Though Plueddenmman teaches the use of polyvinyl chloride and copolymer of vinyl chloride and vinylidene chloride as the solid organic polymer in addition to the above cited styrene polymers (Col. 2, lines 23-34), Plueddenmman does not specifically teach that the solid polymer substrate is a laminate of the poly(styrene-acrylonitrile) and a layer of the vinyl chloride polymers. However, considering Plueddenmman teaches that either polymer may be utilized and that the invention may be utilized to produce laminates and coatings, one having ordinary skill in the art would have been motivated to utilize any of the polymers disclosed by Plueddenmman or laminate combination thereof including a laminate of poly(styrene-acrylonitrile) with polyvinyl chloride or copolymer of vinyl chloride and vinylidene chloride which would read upon the claimed 2nd layer of halo polymer, particularly the claimed chloro-polymers. With respect to the poly(styrene-acrylonitrile) though Plueddenmman specifically utilize the copolymer in one of the

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examples, Plueddenmman does not disclose the percentage of styrene or acrylonitrile in the copolymer, however, in the absence of a showing of unexpected results, one skilled in the art at the time of the invention would have been motivated to utilize any percentage between 0.1 to 99.9% for each of the two components of the copolymer given the reasonable expectation of success. Lastly, with respect to the thickness of the polymer layer, such as a poly(styrene-acrylonitrile) layer, Plueddenmman does not teach the claimed 1-5 micron thickness, however, given that thickness is a known result-effective variable, one skilled in the art at the time of the invention would have been motivated to determine the optimum thickness of the polymer layer to provide the desired mechanical properties for a particular end use of the laminate wherein layers having an order of magnitude as claimed are within the ordinary skill of a person skilled in the art and would have been obvious at the time of the invention.

6. Claims 24-26, 28, 30-34, 36 and 79 are rejected under 35 U.S.C. 103(a) as being unpatentable over Plueddenmman '027. The teachings of Plueddenmman '027 are discussed above. Though Plueddenmman '027 teaches the use of polyvinyl chloride and copolymer of vinyl chloride and vinylidene chloride as the solid organic polymer in addition to the above cited styrene polymers (Col. 2, lines 57-65), Plueddenmman '027 does not specifically teach that the solid polymer substrate is a laminate of the poly(styrene-acrylonitrile) and a layer of the vinyl chloride polymers. However, considering Plueddenmman '027 teaches that either polymer may be utilized and that the invention may be utilized to produce laminates, one having ordinary skill in the art would have been motivated to utilize any of the polymers disclosed by Plueddenmman '027 or laminate combination thereof including a laminate of poly(styrene-acrylonitrile) with polyvinyl chloride or copolymer of vinyl chloride and vinylidene chloride which would read

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upon the claimed 2nd layer of halo polymer, particularly the claimed chloro-polymers. With respect to the poly(styrene-acrylonitrile) though Plueddenmman '027 specifically teaches that the preferred polymer is styrene containing polymer or copolymer and specifically recites poly(styrene-acrylonitrile), Plueddenmman '027 does not disclose the percentage of styrene or acrylonitrile in the copolymer, however, in the absence of a showing of unexpected results, one skilled in the art at the time of the invention would have been motivated to utilize any percentage between 0.1 to 99.9% for each of the two components of the copolymer given the reasonable expectation of success. Lastly, with respect to the thickness of the polymer layer, such as a poly(styrene-acrylonitrile) layer and silane primer layer, Plueddenmman '027 does not teach the claimed thicknesses, however, given that thickness is a known result-effective variable, one skilled in the art at the time of the invention would have been motivated to determine the optimum thickness of the polymer layer to provide the desired mechanical properties for a particular end use of the laminate and the optimum thickness of the silane primer layer to provide the desired adhesive properties for a particular end use, wherein layers having an order of magnitude as claimed are within the ordinary skill of a person skilled in the art and would have been obvious at the time of the invention.

7. Claims 23-26, 28, 30-36, and 78-79 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thomson (USPN 3,585,103.) Thomson teaches a priming composition comprising a polyfunctional azide and a coupling agent including organosilane coupling agents for bonding polymers to glass, metal and metal oxide substrates (Abstract.) Thomson teaches that the polymer to be bonded can be selected from various polymers including styrene-acrylonitrile copolymer and vinyl chloride polymers containing at least 10 mole percent vinyl

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chloride such as poly(vinyl chloride) and vinyl chloride-vinylidene chloride copolymers (Col. 1, line 57-Col. 2, line 8.) Thomson teaches that various silanes may be utilized including ethylenically unsaturated silanes such as γ -methacryloxypropyl trimethoxysilane as well as aromatic silanes such as phenyltrimethoxysilane (reads upon the claimed structure; Col. 2, line 9-29.) Thomson specifically teaches an example bonding glass cloth with styrene-acrylonitrile copolymer containing 10% by weight acrylonitrile wherein the glass cloth is immersed in a primer solution containing γ -methacryloxypropyl trimethoxysilane, dried and then laminated with a styrene-acrylonitrile copolymer sheet (Example 12.) Hence, it would have been obvious to one having ordinary skill in the art at the time of the invention to utilize an organosilane coupling agent in the primer composition, particularly any of the organosilane coupling agents taught by Thomson including phenyltrimethoxysilane to bond the polymer layer, such as styrene-acrylonitrile copolymer containing 10% by weight acrylonitrile as in Example 12, with a glass, metal or metal oxide substrate (reads upon "microelectronic substrate with a surface".) It would also have been obvious to one skilled in the art to substitute the silane coupling agent utilized in Example 12, γ -methacryloxypropyl trimethoxysilane, with phenyltrimethoxysilane, an equivalent silane coupling agent as taught in Col. 2, lines 19-26; thereby producing the claimed structure.

In terms of the weight content of the acrylonitrile in the copolymer, though Thomson teaches a specific example utilizing 10wt%, one having ordinary skill in the art would have been motivated to utilize any weight percent of acrylonitrile given that Thomson broadly teaches styrene-acrylonitrile copolymer in general. Further, considering 10wt% acrylonitrile in the copolymer is specifically taught, one skilled in the art at the time of the invention would have expected weight amounts close to this amount, such as 15wt% or 20wt% to be operable in the

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invention and provide similar results. Though Thomson teaches the use of polyvinyl chloride and copolymer of vinyl chloride and vinylidene chloride as the solid organic polymer in addition to the above cited styrene-acrylonitrile copolymer, Thomson does not specifically teach that the solid polymer substrate is a laminate of the poly(styrene-acrylonitrile) and a layer of the vinyl chloride polymers. However, considering Thomson teaches that either polymer may be utilized and that the invention may be utilized to produce laminates, one having ordinary skill in the art would have been motivated to utilize any of the polymers disclosed by Thomson or laminate combination thereof including a laminate of poly(styrene-acrylonitrile) with polyvinyl chloride or copolymer of vinyl chloride and vinylidene chloride which would read upon the claimed 2nd layer of halo polymer, particularly the claimed chloro-polymers. Lastly, with respect to the thickness of the polymer layer, such as a poly(styrene-acrylonitrile) layer and primer layer, Thomson does not teach the claimed thicknesses, however, given that thickness is a known result-effective variable, one skilled in the art at the time of the invention would have been motivated to determine the optimum thickness of the polymer layer to provide the desired mechanical properties for a particular end use of the laminate and the optimum thickness of the primer layer to provide the desired adhesive properties for a particular end use, wherein layers having an order of magnitude as claimed are within the ordinary skill of a person skilled in the art and would have been obvious at the time of the invention.

Response to Arguments

8. Applicant's arguments filed 6/26/06 have been considered but are moot in view of the new ground(s) of rejection.

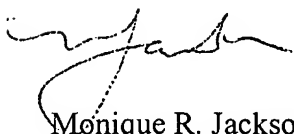
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monique R. Jackson whose telephone number is 571-272-1508.

The examiner can normally be reached on Mondays-Thursdays, 8:00AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on 571-272-1284. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Monique R. Jackson
Primary Examiner
Technology Center 1700
February 20, 2007